Port Sample and Research Cruise Maturity-at-Length Data Collected for Female Pacific Cod *(Gadus macrocephalus)* from Hecate Strait, 1960-87

Canadian Data Report of
Fisheries and Aquatic Sciences
No. 652

Fisheries and Oceans Pêches et Océans

Canada

88-01213/

Canadian Data Report of Fisheries and Aquatic Sciences

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Canadian Data Report of
Fisheries and Aquatic Sciences No. 652

May 1987

PORT SAMPLE AND RESEARCH CRUISE MATURITY-AT-LENGTH DATA COLLECTED FOR FEMALE PACIFIC COD (*Gadus macrocephalus*) FROM HECATE STRAIT, 1960-87

by

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Cat. No. Fs 97-13/652E ISSN 0706-6465

Correct citation for this publication:

Foucher, R. P. and D. W. Welch. 1987. Port sample and research cruise maturity-at-length data collected for female Pacific cod (Gadus macrocephalus) from Hecate Strait, 1960-87. Can. Data Rep. Fish. Aquat. Sci. 652: 19 p.

ABSTRACT

Foucher, R. P. and D. W. Welch. 1987. Port sample and research cruise maturity-at-length data collected for female Pacific cod (Gadus macrocephalus) from Hecate Strait, 1960-87. Can. Data Rep. Fish. Aquat. Sci. 652: 19 p.

Data on numbers at length and percent maturity at length for female Pacific cod is presented for samples used in a study of maturity at length by year and area. These data include 2,559 immature and 5,047 mature fish sampled during the January to March spawning season over the period 1960-87. Of the 45 samples, 41 are from commercial landings while the remaining 4 are from research cruises.

RESUME

Foucher, R. P. and D. W. Welch. 1987. Port sample and research cruise maturity-at-length data collected for female Pacific cod (Gadus macrocephalus) from Hecate Strait, 1960-87. Can. Data Rep. Fish. Aquat. Sci. 652: 19 p.

On présente des données sur les fréquences de longueurs et le pourcentage d'individus matures selon l'âge chez les femelles de la morue du Pacifique. Ces données ont été recueillies d'échantillons utilisés pour une étude de la maturité selon l'âge en fonction de l'année et de la région et portent sur 2 559 individus immatures et 5 047 individus matures capturés au cours de la fraieson que a lieu de janvier à mars. Des 45 échantillons recueillis de 1960 à 1987, 41 proviennent de débarquements commerciaux tandis que les quatre autres ont été obtenus au cours d'expéditions de recherche.

INTRODUCTION

Maturity-at-length data has been collected for Pacific cod landed in British Columbia ports on a regular basis since 1975. This data has never been published and has not been extensively analyzed.

The authors have found large interannual differences in the length at 50% maturity in an analysis of changes in maturity-at-length of female Pacific cod (Welch and Foucher In prep.). To make this data available to others who might be interested in our analysis we have compiled and presented the data here.

Similar data has also been collected on various research cruises and is very useful as the smaller (below-commercial-size) fish are relatively more numerous than in port samples. These data are also included.

MATERIALS AND METHODS

To reduce seasonal or geographic variability our study concentrated on landings from the White Rocks area of Hecate Strait (approximate position: 53°30'N latitude, 130°45'W longitude) made during January-March. The data were collected over the period 1960-87.

White Rocks is a spawning ground for Pacific cod (Ketchen 1964) and produced an average of 55% of the total first-quarter landings from Area 5D (northern Hecate Strait) from 1960-82 (Foucher and Westrheim 1984). It was chosen as the geographic area for our study because of the availability of data.

Where sampling within a year was sufficiently intensive (1980 and 1987), between-sample variation was examined by analysing each sample separately. In other years individual samples were combined.

For one year (1980) numerous port samples from two other grounds are also available, and were used to examine geographic variation within Hecate Strait. These data are for the Reef Island (52°55'N latitude, 131°15'W longitude) and Two Peaks (54°20'N latitude, 131°10'W longitude) grounds.

Although sampling of Pacific cod from commercial landings began in the 1950s it was not until 1975 that maturity data was collected. Initially, maturity was classified as immature, mature, spent, or resting and from 1976 on, according to a seven-stage scale (Westrheim 1977). For the purpose of determining length at maturity a two-stage scale (immature or mature) is sufficient, and the data is so reported here. Stages 1 and 2 as defined by Westrheim (1977) are included in the immature category, stages 3-7 are included in the mature category.

Table 1 shows an inventory of commercial (port-sample) and research-cruise data collected. Table 2 shows the data used to produce the maturity ogives in Welch and Foucher (In prep.).

ACKNOWLEDGMENTS

The collection of maturity-at-length data was started under the direction of S. J. Westrheim. We are also grateful for the efforts of the many people who have collected port samples over the years.

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Westrheim, S. J. 1977. Length-weight and length-girth relationships, maturity, spawning season and diet of Pacific cod (Gadus macrocephalus) collected in British Columbia waters during April 1975-February 1976. Fish. Res. Board Can. MS Rep. 1420: 68 p.

Table 1. Inventory of female Pacific cod maturity-at-length samples from Hecate Strait, 1960-87.

Year	Month/day	Area[a]	Sample type[b]	No. sampled		
				Imm	Mat	Tot
1960	2/1-10	WR	R	372	64	436
1961	1/29-2/17	WR	R	190	167	357
1975	2/18-3/10	WR	C	23	155	178
1976	2/12-14	WR	R	77	38	115
1978	2/9-28	WR	C	11	205	216
1979	1/04-2/16	WR	C	145	307	452
1980	1/07	WR	C	25	28	53
	1/10	WR	C	30	24	54
	1/10	WR	C	94	100	194
	1/15	WR	C	35	46	81
	1/24	WR	C	25	30	55
	1/28	WR	C	28	34	62
	1/29	WR	C	35	25	60
	2/13	WR	C	15	42	57
	2/18	WR	C	22	40	62
	2/19	WR	C	7	53	60
	2/25	WR	C	12	84	96
	3/03	WR	C	18	48	66
	3/20	WR	C	10	48	58
	3/25	WR	C	18	40	58
	3/31	WR	C	27	70	97
	1/14	RI	C	7	42	49
	1/21	RI	C	6	49	55
	1/29	RI	C	0	55	55
	2/25	RI	C	3	71	74
	2/11	TP	C	35	24	59
	2/12	TP	C	36	27	63
	2/20	TP	C	8	42	50
	2/22	TP	C	25	36	61
	3/10	TP	C	16	35	51
	3/31	TP	C	81	26	107
1982	1/13-2/09	WR	C	70	152	222
1983	2/08-3/22	WR	C	54	804	858
1985	2/07-3/20	WR	C	9	288	297
1986	1/21-3/10	WR	C	31	317	348
1987	1/7-11	WR	R	279	387	666
	1/14	WR	C	55	139	194
	1/15	WR	C	156	67	223
	1/19	WR	C	12	95	107
	1/22	WR	C	98	112	210
	1/28	WR	C	53	87	140
	2/05	WR	C	174	36	210
	2/19	WR	C	39	223	262
	2/20	WR	C	33	107	140
	2/26	WR	C	60	178	238
	3/19	WR	C	135	97	232

[a]RI-Reef Island, TP-Two Peaks, WR-White Rocks
[b]C-Commercial, R-Research

Table 2. Length frequency (immature, mature and total) and percent maturity at length for female Pacific cod sampled for maturity from Hecate Strait, 1960-87 (C = commercial sample, R = research sample).

Length	White Rocks R 2/1-10, 1960				White Rocks R 1/29-2/17, 1961				White Rocks C 2/18-3/10, 1975			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
33	1	-	1	0	-	-	-	-	-	-	-	-
34	0	-	0	-	-	-	-	-	-	-	-	-
35	0	-	0	-	-	-	-	-	-	-	-	-
36	1	-	1	0	-	-	-	-	-	-	-	-
37	12	-	12	0	4	-	4	0	-	-	-	-
38	10	-	10	0	7	-	7	0	-	-	-	-
39	21	-	21	0	8	-	8	0	-	-	-	-
40	34	-	34	0	14	1	15	7	-	-	-	-
41	33	-	33	0	6	0	6	0	-	-	-	-
42	43	-	43	0	21	0	21	0	-	-	-	-
43	43	-	43	0	21	0	21	0	-	-	-	-
44	34	1	35	3	8	0	8	0	-	-	-	-
45	32	3	35	9	20	0	20	0	1	1	2	50
46	22	0	22	0	8	0	8	0	0	0	0	-
47	26	0	26	0	4	0	4	0	2	2	4	50
48	12	0	12	0	3	0	3	0	1	0	1	0
49	14	0	14	0	4	2	6	33	1	1	2	50
50	8	3	11	27	2	2	4	50	1	4	5	80
51	2	0	2	0	5	4	9	44	1	4	5	80
52	0	0	0	-	5	3	8	38	2	2	4	50
53	8	2	10	20	4	4	8	50	6	5	11	45
54	6	1	7	14	3	8	11	73	0	6	6	100
55	2	2	4	50	9	6	15	40	0	5	5	100
56	0	4	4	100	7	1	8	13	1	8	9	89
57	4	9	13	69	4	12	16	75	1	7	8	88
58	1	3	4	75	14	4	18	22	0	8	8	100
59	0	3	3	100	0	11	11	100	1	6	7	86
60	3	6	9	67	3	9	12	75	0	9	9	100
61	-	3	3	100	0	8	8	100	2	7	9	78
62	-	7	7	100	2	14	16	88	0	12	12	100
63	-	3	3	100	0	8	8	100	1	2	3	67
64	-	1	1	100	0	6	6	100	0	5	5	100
65	-	3	3	100	2	9	11	82	0	12	12	100
66	-	5	5	100	0	6	6	100	1	5	6	83
67	-	1	1	100	0	2	2	100	0	2	2	100
68	-	0	0	-	2	12	14	86	0	7	7	100
69	-	0	0	-	-	7	7	100	0	5	5	100
70	-	0	0	-	-	12	12	100	0	4	4	100
71	-	1	1	100	-	2	2	100	0	4	4	100
72	-	0	0	-	-	3	3	100	1	2	3	67
73	-	0	0	-	-	0	0	-	-	2	2	100
74	-	0	0	-	-	1	1	100	-	4	4	100
75	-	1	1	100	-	4	4	100	-	2	2	100
76	-	2	2	100	-	0	0	-	-	0	0	-
77	-	-	-	-	-	0	0	-	-	4	4	100
78	-	-	-	-	-	2	2	100	-	2	2	100
79	-	-	-	-	-	0	0	-	-	1	1	100
80	-	-	-	-	-	1	1	100	-	0	0	-
81	-	-	-	-	-	0	0	-	-	0	0	-
82	-	-	-	-	-	0	0	-	-	1	1	100
83	-	-	-	-	-	1	1	100	-	1	1	100
84	-	-	-	-	-	0	0	-	-	0	0	-
85	-	-	-	-	-	0	0	-	-	2	2	100
86	-	-	-	-	-	0	0	-	-	0	0	-
87	-	-	-	-	-	1	1	100	-	0	0	-
88	-	-	-	-	-	1	1	100	-	0	0	-
97	-	-	-	-	-	-	-	-	-	1	1	100
Total	372	64	436		190	167	357		23	155	178	

Table 2. (cont'd)

Length	White Rocks R 2/12-14, 1976				White Rocks C 2/9-28, 1978				White Rocks C 1/4-2/16, 1979			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
23	-	-	-	-	-	-	-	-	1	-	1	0
24	-	-	-	-	-	-	-	-	0	-	0	-
25	-	-	-	-	-	-	-	-	0	-	0	-
26	-	-	-	-	-	-	-	-	0	-	0	-
27	-	-	-	-	-	-	-	-	1	-	1	0
28	-	-	-	-	-	-	-	-	2	-	2	0
29	-	-	-	-	-	-	-	-	1	-	1	0
30	-	-	-	-	-	-	-	-	0	-	0	-
31	-	-	-	-	-	-	-	-	0	-	0	-
32	4	-	4	0	-	-	-	-	0	-	0	-
33	0	-	0	-	-	-	-	-	0	-	0	-
34	0	-	0	-	-	-	-	-	1	-	1	0
35	10	-	10	0	-	-	-	-	1	-	1	0
36	0	-	0	-	-	-	-	-	3	-	3	0
37	0	-	0	-	-	-	-	-	1	1	2	50
38	10	-	10	0	-	1	1	100	6	0	6	0
39	0	-	0	-	-	0	0	-	3	1	4	25
40	0	-	0	-	-	0	0	-	4	1	5	20
41	10	-	10	0	-	1	1	100	8	2	10	20
42	0	-	0	-	1	1	2	50	13	3	16	19
43	0	-	0	-	1	3	4	75	8	4	12	33
44	10	-	10	0	1	3	4	75	17	4	21	19
45	0	-	0	-	1	5	6	83	22	1	23	4
46	0	-	0	-	1	3	4	75	16	5	21	24
47	9	1	10	10	0	9	9	100	12	2	14	14
48	0	0	0	-	1	10	11	91	4	6	10	60
49	0	0	0	-	0	9	9	100	6	2	8	25
50	7	2	9	22	1	11	12	92	5	2	7	29
51	0	0	0	-	3	14	17	82	2	1	3	33
52	0	3	3	100	0	12	12	100	3	1	4	25
53	8	0	8	0	1	8	9	89	0	2	2	100
54	0	0	0	-	-	12	12	100	0	3	3	100
55	0	0	0	-	-	13	13	100	2	4	6	67
56	5	6	11	55	-	7	7	100	1	4	5	80
57	0	0	0	-	-	4	4	100	1	6	7	86
58	0	0	0	-	-	7	7	100	0	3	3	100
59	4	4	8	50	-	8	8	100	0	10	10	100
60	-	0	0	-	-	4	4	100	0	13	13	100
61	-	0	0	-	-	5	5	100	1	14	15	93
62	-	7	7	100	-	10	10	100	-	9	9	100
63	-	0	0	-	-	11	11	100	-	11	11	100
64	-	0	0	-	-	5	5	100	-	17	17	100
65	-	7	7	100	-	5	5	100	-	23	23	100
66	-	0	0	-	-	5	5	100	-	19	19	100
67	-	0	0	-	-	4	4	100	-	22	22	100
68	-	4	4	100	-	3	3	100	-	15	15	100
69	-	0	0	-	-	0	0	-	-	20	20	100
70	-	0	0	-	-	1	1	100	-	13	13	100
71	-	3	3	100	-	2	2	100	-	8	8	100
72	-	1	1	100	-	3	3	100	-	12	12	100
73	-	-	-	-	-	0	0	-	-	9	9	100
74	-	-	-	-	-	3	3	100	-	6	6	100
75	-	-	-	-	-	0	0	-	-	8	8	100
76	-	-	-	-	-	0	0	-	-	4	4	100
77	-	-	-	-	-	0	0	-	-	2	2	100
78	-	-	-	-	-	0	0	-	-	3	3	100
79	-	-	-	-	-	2	2	100	-	3	3	100
80	-	-	-	-	-	0	0	-	-	6	6	100
81	-	-	-	-	-	0	0	-	-	0	0	-
82	-	-	-	-	-	0	0	-	-	0	0	-
83	-	-	-	-	-	1	1	100	-	0	0	-
84	-	-	-	-	-	-	-	-	-	2	2	100
Total	77	38	115		11	205	216		145	307	452	

Table 2. (cont'd)

Length	White Rocks C 1/7, 1980				White Rocks C 1/10, 1980				White Rocks C 1/10, 1980			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
38	1	-	1	0	-	-	-	-	-	-	-	-
39	0	-	0	-	-	-	-	-	-	-	-	-
40	0	-	0	-	-	-	-	-	-	-	-	-
41	0	-	0	-	2	-	2	0	2	-	2	0
42	1	-	1	0	2	-	2	0	2	-	2	0
43	0	-	0	-	2	-	2	0	5	1	6	17
44	0	-	0	-	1	-	1	0	3	0	3	0
45	3	-	3	0	2	-	2	0	2	0	2	0
46	3	-	3	0	5	-	5	0	4	1	5	20
47	2	-	2	0	2	1	3	33	8	1	9	11
48	1	1	2	50	3	0	3	0	6	2	8	25
49	4	0	4	0	4	1	5	20	3	4	7	57
50	3	3	6	50	1	0	1	0	12	8	20	40
51	2	2	4	50	1	2	3	67	8	7	15	47
52	1	1	2	50	2	2	4	50	3	7	10	70
53	0	3	3	100	0	1	1	100	14	5	19	26
54	0	4	4	100	2	3	5	60	8	6	14	43
55	2	1	3	33	0	0	0	-	1	11	12	92
56	1	2	3	67	0	2	2	100	5	8	13	62
57	0	2	2	100	1	0	1	0	7	6	13	46
58	1	0	1	0	-	1	1	100	0	5	5	100
59	-	0	0	-	-	3	3	100	0	5	5	100
60	-	2	2	100	-	2	2	100	1	3	4	75
61	-	1	1	100	-	0	0	-	-	4	4	100
62	-	0	0	-	-	2	2	100	-	2	2	100
63	-	2	2	100	-	1	1	100	-	1	1	100
64	-	1	1	100	-	1	1	100	-	1	1	100
65	-	0	0	-	-	1	1	100	-	2	2	100
66	-	0	0	-	-	0	0	-	-	1	1	100
67	-	0	0	-	-	0	0	-	-	1	1	100
68	-	2	2	100	-	0	0	-	-	1	1	100
69	-	0	0	-	-	0	0	-	-	1	1	100
70	-	0	0	-	-	0	0	-	-	0	0	-
71	-	1	1	100	-	0	0	-	-	0	0	-
72	-	-	-	-	-	0	0	-	-	3	3	100
73	-	-	-	-	-	0	0	-	-	0	0	-
74	-	-	-	-	-	0	0	-	-	0	0	-
75	-	-	-	-	-	0	0	-	-	0	0	-
76	-	-	-	-	-	0	0	-	-	0	0	-
77	-	-	-	-	-	0	0	-	-	1	1	100
78	-	-	-	-	-	0	0	-	-	0	0	-
79	-	-	-	-	-	1	1	100	-	1	1	100
80	-	-	-	-	-	-	-	-	-	0	0	-
81	-	-	-	-	-	-	-	-	-	0	0	-
82	-	-	-	-	-	-	-	-	-	0	0	-
83	-	-	-	-	-	-	-	-	-	0	0	-
84	-	-	-	-	-	-	-	-	-	0	0	-
85	-	-	-	-	-	-	-	-	-	0	0	-
86	-	-	-	-	-	-	-	-	-	0	0	-
87	-	-	-	-	-	-	-	-	-	0	0	-
88	-	-	-	-	-	-	-	-	-	0	0	-
89	-	-	-	-	-	-	-	-	-	0	0	-
90	-	-	-	-	-	-	-	-	-	0	0	-
91	-	-	-	-	-	-	-	-	-	0	0	-
92	-	-	-	-	-	-	-	-	-	1	1	100
Total	25	28	53		30	24	54		94	100	194	

Table 2. (cont'd)

Length	White Rocks C 1/15, 1980				White Rocks C 1/24, 1980				White Rocks C 1/28, 1980			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
36	-	-	-	-	1	-	1	0	-	-	-	-
37	-	-	-	-	0	-	0	-	-	-	-	-
38	-	-	-	-	0	-	0	-	-	-	-	-
39	-	-	-	-	0	-	0	-	-	-	-	-
40	-	-	-	-	1	-	1	0	-	-	-	-
41	-	-	-	-	3	-	3	0	-	-	-	-
42	-	-	-	-	2	-	2	0	1	-	1	0
43	1	-	1	0	3	-	3	0	0	-	0	-
44	0	-	0	-	1	-	1	0	1	-	1	0
45	2	-	2	0	1	-	1	0	0	-	0	-
46	4	-	4	0	1	-	1	0	1	-	1	0
47	3	-	3	0	0	-	0	-	5	-	5	0
48	2	1	3	33	1	-	1	0	2	1	3	33
49	1	0	1	0	2	2	4	50	1	1	2	50
50	1	2	3	67	1	2	3	67	4	1	5	20
51	4	3	7	43	2	3	5	60	2	2	4	50
52	3	4	7	57	1	1	2	50	4	1	5	20
53	3	6	9	67	2	2	4	50	1	1	2	50
54	1	2	3	67	2	1	3	33	2	2	4	50
55	7	2	9	22	1	2	3	67	0	4	4	100
56	1	1	2	50	-	3	3	100	2	2	4	50
57	1	2	3	67	-	0	0	-	1	3	4	75
58	1	0	1	0	-	3	3	100	0	0	0	-
59	-	4	4	100	-	2	2	100	1	1	2	50
60	-	2	2	100	-	1	1	100	-	1	1	100
61	-	0	0	-	-	1	1	100	-	3	3	100
62	-	1	1	100	-	1	1	100	-	1	1	100
63	-	3	3	100	-	1	1	100	-	1	1	100
64	-	0	0	-	-	0	0	-	-	1	1	100
65	-	0	0	-	-	1	1	100	-	0	0	-
66	-	2	2	100	-	0	0	-	-	2	2	100
67	-	0	0	-	-	0	0	-	-	0	0	-
68	-	2	2	100	-	0	0	-	-	0	0	-
69	-	0	0	-	-	1	1	100	-	2	2	100
70	-	2	2	100	-	0	0	-	-	0	0	-
71	-	0	0	-	-	0	0	-	-	1	1	100
72	-	2	2	100	-	0	0	-	-	1	1	100
73	-	1	1	100	-	0	0	-	-	1	1	100
74	-	2	2	100	-	1	1	100	-	0	0	-
75	-	0	0	-	-	0	0	-	-	1	1	100
76	-	0	0	-	-	0	0	-	-	-	-	-
77	-	1	1	100	-	0	0	-	-	-	-	-
78	-	0	0	-	-	0	0	-	-	-	-	-
79	-	0	0	-	-	0	0	-	-	-	-	-
80	-	0	0	-	-	0	0	-	-	-	-	-
81	-	0	0	-	-	2	2	100	-	-	-	-
82	-	0	0	-	-	-	-	-	-	-	-	-
83	-	1	1	100	-	-	-	-	-	-	-	-
Total	35	46	81		25	30	55		28	34	62	

Table 2. (cont'd)

Length	White Rocks C 1/29, 1980				White Rocks C 2/13, 1980				White Rocks C 2/18, 1980			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
38	1	-	1	0	-	-	-	-	-	-	-	-
39	1	-	1	0	-	-	-	-	-	-	-	-
40	3	-	3	0	-	-	-	-	-	-	-	-
41	3	-	3	0	-	-	-	-	-	-	-	-
42	3	-	3	0	-	-	-	-	1	-	1	0
43	6	-	6	0	-	-	-	-	0	-	0	-
44	2	-	2	0	1	-	1	0	4	1	5	20
45	3	-	3	0	0	-	0	-	1	0	1	0
46	0	-	0	-	0	-	0	-	0	0	0	-
47	1	1	2	50	1	-	1	0	2	0	2	0
48	2	0	2	0	1	-	1	0	4	1	5	20
49	2	0	2	0	0	-	0	-	1	1	2	50
50	3	0	3	0	0	1	1	100	1	1	2	50
51	1	0	1	0	4	0	4	0	0	1	1	100
52	1	1	2	50	0	0	0	-	2	1	3	33
53	1	2	3	67	0	2	2	100	1	0	1	0
54	0	3	3	100	1	2	3	67	1	2	3	67
55	2	2	4	50	1	2	3	67	0	1	1	100
56	-	1	1	100	1	1	2	50	0	3	3	100
57	-	5	5	100	0	3	3	100	3	1	4	25
58	-	1	1	100	0	4	4	100	0	3	3	100
59	-	2	2	100	3	3	6	50	0	5	5	100
60	-	1	1	100	1	5	6	83	1	6	7	86
61	-	1	1	100	0	0	0	-	-	0	0	-
62	-	0	0	-	0	2	2	100	-	1	1	100
63	-	0	0	-	0	2	2	100	-	0	0	-
64	-	1	1	100	1	1	2	50	-	3	3	100
65	-	0	0	-	-	3	3	100	-	0	0	-
66	-	1	1	100	-	2	2	100	-	1	1	100
67	-	1	1	100	-	1	1	100	-	0	0	-
68	-	1	1	100	-	1	1	100	-	0	0	-
69	-	0	0	-	-	0	0	-	-	1	1	100
70	-	0	0	-	-	2	2	100	-	0	0	-
71	-	0	0	-	-	1	1	100	-	0	0	-
72	-	0	0	-	-	1	1	100	-	0	0	-
73	-	0	0	-	-	1	1	100	-	0	0	-
74	-	0	0	-	-	0	0	-	-	2	2	100
75	-	0	0	-	-	0	0	-	-	4	4	100
76	-	1	1	100	-	0	0	-	-	0	0	-
77	-	-	-	-	-	0	0	-	-	0	0	-
78	-	-	-	-	-	0	0	-	-	0	0	-
79	-	-	-	-	-	1	1	100	-	0	0	-
80	-	-	-	-	-	0	0	-	-	0	0	-
81	-	-	-	-	-	1	1	100	-	0	0	-
82	-	-	-	-	-	-	-	-	-	0	0	-
83	-	-	-	-	-	-	-	-	-	0	0	-
84	-	-	-	-	-	-	-	-	-	0	0	-
85	-	-	-	-	-	-	-	-	-	1	1	100
Total	35	25	60		15	42	57		22	40	62	

Table 2. (cont'd)

Length	White Rocks C 2/19, 1980				White Rocks C 2/25, 1980				White Rocks C 3/3, 1980			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
39	1	-	1	0	-	-	-	-	-	-	-	-
40	0	-	0	-	-	-	-	-	-	-	-	-
41	0	-	0	-	-	-	-	-	-	-	-	-
42	0	1	1	100	-	1	1	100	-	-	-	-
43	1	0	1	0	-	0	0	-	-	-	-	-
44	2	0	2	0	-	0	0	-	-	-	-	-
45	0	0	0	-	1	0	1	0	-	-	-	-
46	0	0	0	-	0	1	1	100	2	-	2	0
47	0	0	0	-	0	0	0	-	1	-	1	0
48	1	1	2	50	1	1	2	50	1	-	1	0
49	1	0	1	0	0	1	1	100	0	1	1	100
50	0	0	0	-	0	3	3	100	3	1	4	25
51	0	2	2	100	2	1	3	33	2	0	2	0
52	0	3	3	100	1	1	2	50	2	0	2	0
53	1	4	5	80	0	6	6	100	2	1	3	33
54	-	2	2	100	3	0	3	0	0	4	4	100
55	-	2	2	100	1	6	7	86	1	2	3	67
56	-	2	2	100	0	4	4	100	2	2	4	50
57	-	3	3	100	0	2	2	100	1	3	4	75
58	-	4	4	100	1	5	6	83	0	2	2	100
59	-	0	0	-	1	5	6	83	0	4	4	100
60	-	7	7	100	0	3	3	100	1	4	5	80
61	-	3	3	100	1	8	9	89	-	2	2	100
62	-	4	4	100	-	6	6	100	-	3	3	100
63	-	2	2	100	-	2	2	100	-	2	2	100
64	-	2	2	100	-	6	6	100	-	3	3	100
65	-	1	1	100	-	1	1	100	-	1	1	100
66	-	0	0	-	-	5	5	100	-	2	2	100
67	-	1	1	100	-	2	2	100	-	3	3	100
68	-	0	0	-	-	3	3	100	-	1	1	100
69	-	3	3	100	-	0	0	-	-	1	1	100
70	-	2	2	100	-	3	3	100	-	1	1	100
71	-	0	0	-	-	1	1	100	-	0	0	-
72	-	0	0	-	-	1	1	100	-	2	2	100
73	-	1	1	100	-	0	0	-	-	0	0	-
74	-	0	0	-	-	1	1	100	-	0	0	-
75	-	0	0	-	-	2	2	100	-	1	1	100
76	-	1	1	100	-	1	1	100	-	0	0	-
77	-	0	0	-	-	1	1	100	-	1	1	100
78	-	1	1	100	-	0	0	-	-	0	0	-
79	-	1	1	100	-	0	0	-	-	0	0	-
80	-	-	-	-	-	0	0	-	-	1	1	100
81	-	-	-	-	-	0	0	-	-	-	-	-
82	-	-	-	-	-	0	0	-	-	-	-	-
83	-	-	-	-	-	0	0	-	-	-	-	-
84	-	-	-	-	-	0	0	-	-	-	-	-
85	-	-	-	-	-	0	0	-	-	-	-	-
86	-	-	-	-	-	0	0	-	-	-	-	-
87	-	-	-	-	-	1	1	100	-	-	-	-
Total	7	53	60		12	84	96		18	48	66	

Table 2. (cont'd)

Length	White Rocks C 3/20, 1980				White Rocks C 3/25, 1980				White Rocks C 3/31, 1980			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
40	-	-	-	-	1	-	1	0	-	-	-	-
41	-	-	-	-	0	-	0	-	-	-	-	-
42	-	-	-	-	3	-	3	0	-	-	-	-
43	-	-	-	-	0	-	0	-	-	-	-	-
44	1	-	1	0	1	-	1	0	-	-	-	-
45	0	-	0	-	0	1	1	100	1	-	1	0
46	0	-	0	-	1	0	1	0	0	-	0	-
47	0	1	1	100	2	0	2	0	1	1	2	50
48	0	0	0	-	0	0	0	-	2	0	2	0
49	0	0	0	-	0	0	0	-	4	0	4	0
50	0	0	0	-	0	0	0	-	3	0	3	0
51	1	0	1	0	2	0	2	0	3	1	4	25
52	2	0	2	0	1	1	2	50	1	0	1	0
53	0	0	0	-	0	2	2	100	2	2	4	50
54	0	1	1	100	0	3	3	100	1	3	4	75
55	1	0	1	0	1	2	3	67	3	2	5	40
56	2	2	4	50	1	2	3	67	1	2	3	67
57	1	1	2	50	0	2	2	100	2	2	4	50
58	0	6	6	100	2	4	6	67	0	6	6	100
59	1	1	2	50	1	5	6	83	1	4	5	80
60	1	5	6	83	0	4	4	100	0	2	2	100
61	-	1	1	100	1	2	3	67	0	5	5	100
62	-	3	3	100	1	1	2	50	0	3	3	100
63	-	3	3	100	-	1	1	100	0	3	3	100
64	-	4	4	100	-	0	0	-	1	2	3	67
65	-	1	1	100	-	0	0	-	1	2	3	67
66	-	2	2	100	-	0	0	-	-	1	1	100
67	-	3	3	100	-	0	0	-	-	3	3	100
68	-	1	1	100	-	1	1	100	-	1	1	100
69	-	2	2	100	-	1	1	100	-	4	4	100
70	-	2	2	100	-	0	0	-	-	3	3	100
71	-	1	1	100	-	1	1	100	-	4	4	100
72	-	1	1	100	-	3	3	100	-	3	3	100
73	-	0	0	-	-	1	1	100	-	0	0	-
74	-	1	1	100	-	1	1	100	-	2	2	100
75	-	2	2	100	-	0	0	-	-	1	1	100
76	-	0	0	-	-	0	0	-	-	1	1	100
77	-	1	1	100	-	1	1	100	-	0	0	-
78	-	0	0	-	-	0	0	-	-	2	2	100
79	-	0	0	-	-	0	0	-	-	1	1	100
80	-	0	0	-	-	0	0	-	-	2	2	100
81	-	1	1	100	-	0	0	-	-	2	2	100
82	-	0	0	-	-	0	0	-	-	-	-	-
83	-	0	0	-	-	0	0	-	-	-	-	-
84	-	1	1	100	-	0	0	-	-	-	-	-
85	-	1	1	100	-	0	0	-	-	-	-	-
86	-	-	-	-	-	0	0	-	-	-	-	-
87	-	-	-	-	-	1	1	100	-	-	-	-
Total	10	48	58		18	40	58		27	70	97	

Table 2. (cont'd)

Length	Reef Island C 1/14, 1980				Reef Island C 1/21, 1980				Reef Island C 1/29, 1980			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
43	1	-	1	0	-	1	1	100	-	-	0	-
44	0	-	0	-	-	1	1	100	-	-	0	-
45	0	-	0	-	1	0	1	0	-	-	0	-
46	1	-	1	0	1	2	3	67	-	-	0	-
47	0	2	2	100	1	2	3	67	-	1	1	100
48	2	1	3	33	1	0	1	0	-	1	1	100
49	0	3	3	100	1	1	2	50	-	3	3	100
50	0	0	0	-	0	5	5	100	-	4	4	100
51	0	0	0	-	0	2	2	100	-	4	4	100
52	1	0	1	0	0	3	3	100	-	1	1	100
53	0	2	2	100	0	0	0	-	-	1	1	100
54	0	0	0	-	1	2	3	67	-	2	2	100
55	0	3	3	100	-	2	2	100	-	2	2	100
56	0	1	1	100	-	1	1	100	-	2	2	100
57	2	1	3	33	-	2	2	100	-	1	1	100
58	-	0	0	-	-	1	1	100	-	0	0	-
59	-	6	6	100	-	0	0	-	-	0	0	-
60	-	2	2	100	-	3	3	100	-	1	1	100
61	-	1	1	100	-	0	0	-	-	1	1	100
62	-	1	1	100	-	1	1	100	-	1	1	100
63	-	1	1	100	-	4	4	100	-	0	0	-
64	-	3	3	100	-	1	1	100	-	2	2	100
65	-	2	2	100	-	3	3	100	-	2	2	100
66	-	1	1	100	-	0	0	-	-	2	2	100
67	-	1	1	100	-	3	3	100	-	1	1	100
68	-	0	0	-	-	0	0	-	-	4	4	100
69	-	1	1	100	-	3	3	100	-	3	3	100
70	-	2	2	100	-	2	2	100	-	3	3	100
71	-	2	2	100	-	2	2	100	-	3	3	100
72	-	3	3	100	-	0	0	-	-	3	3	100
73	-	0	0	-	-	0	0	-	-	1	1	100
74	-	0	0	-	-	1	1	100	-	1	1	100
75	-	1	1	100	-	0	0	-	-	0	0	-
76	-	0	0	-	-	0	0	-	-	1	1	100
77	-	0	0	-	-	1	1	100	-	1	1	100
78	-	0	0	-	-	-	-	-	-	1	1	100
79	-	1	1	100	-	-	-	-	-	1	1	100
80	-	1	1	100	-	-	-	-	-	1	1	100
Total	7	42	49		6	49	55		0	55	55	

Table 2. (cont'd)

Length	Reef Island C 2/25, 1980				Two Peaks C 2/11, 1980				Two Peaks C 2/12, 1980			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
41	-	-	-	-	1	-	1	0	-	-	-	-
42	-	-	-	-	0	-	0	-	1	-	1	0
43	-	-	-	-	1	-	1	0	1	-	1	0
44	-	-	-	-	0	-	0	-	4	-	4	0
45	-	1	1	100	7	-	7	0	4	-	4	0
46	1	1	2	50	3	-	3	0	2	-	2	0
47	0	3	3	100	1	-	1	0	8	-	8	0
48	1	3	4	75	1	-	1	0	3	-	3	0
49	0	0	0	-	2	-	2	0	1	-	1	0
50	1	3	4	75	2	-	2	0	1	-	1	0
51	-	6	6	100	1	-	1	0	0	-	0	-
52	-	4	4	100	0	-	0	-	2	-	2	0
53	-	2	2	100	2	-	2	0	1	-	1	0
54	-	5	5	100	1	-	1	0	0	1	1	100
55	-	3	3	100	1	-	1	0	1	1	2	50
56	-	5	5	100	3	1	4	25	2	0	2	0
57	-	5	5	100	1	1	2	50	1	1	2	50
58	-	7	7	100	1	0	1	0	1	2	3	67
59	-	5	5	100	2	2	4	50	0	1	1	100
60	-	3	3	100	3	0	3	0	1	0	1	0
61	-	2	2	100	1	3	4	75	0	4	4	100
62	-	1	1	100	1	2	3	67	0	1	1	100
63	-	2	2	100	-	2	2	100	2	3	5	60
64	-	0	0	-	-	1	1	100	-	1	1	100
65	-	1	1	100	-	0	0	-	-	0	0	-
66	-	0	0	-	-	0	0	-	-	2	2	100
67	-	1	1	100	-	1	1	100	-	0	0	-
68	-	3	3	100	-	1	1	100	-	1	1	100
69	-	0	0	-	-	0	0	-	-	0	0	-
70	-	0	0	-	-	2	2	100	-	1	1	100
71	-	0	0	-	-	1	1	100	-	0	0	-
72	-	1	1	100	-	0	0	-	-	0	0	-
73	-	2	2	100	-	1	1	100	-	1	1	100
74	-	1	1	100	-	0	0	-	-	2	2	100
75	-	0	0	-	-	0	0	-	-	0	0	-
76	-	0	0	-	-	1	1	100	-	0	0	-
77	-	0	0	-	-	0	0	-	-	1	1	100
78	-	0	0	-	-	1	1	100	-	0	0	-
79	-	0	0	-	-	2	2	100	-	0	0	-
80	-	0	0	-	-	0	0	-	-	0	0	-
81	-	0	0	-	-	0	0	-	-	1	1	100
82	-	0	0	-	-	1	1	100	-	0	0	-
83	-	0	0	-	-	1	1	100	-	1	1	100
84	-	1	1	100	-	-	-	-	-	0	0	-
85	-	-	-	-	-	-	-	-	-	1	1	100
86	-	-	-	-	-	-	-	-	-	1	1	100
Total	3	71	74		35	24	59		36	27	63	

Table 2. (cont'd)

Length	Two Peaks C 2/20, 1980				Two Peaks C 2/22, 1980				Two Peaks C 3/10, 1980			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
41	-	-	-	-	1	-	1	0	-	-	-	-
42	-	-	-	-	2	-	2	0	-	-	-	-
43	-	-	-	-	2	-	2	0	-	-	-	-
44	-	-	-	-	4	-	4	0	1	-	1	0
45	-	-	-	-	1	-	1	0	1	-	1	0
46	1	-	1	0	2	-	2	0	0	-	0	-
47	0	-	0	-	4	-	4	0	1	-	1	0
48	0	-	0	-	2	-	2	0	0	-	0	-
49	0	-	0	-	1	-	1	0	1	-	1	0
50	0	-	0	-	0	-	0	-	3	-	3	0
51	2	2	4	50	0	-	0	-	0	-	0	-
52	0	0	0	-	0	-	0	-	0	-	0	-
53	1	0	1	0	0	-	0	-	0	-	0	-
54	1	1	2	50	0	-	0	-	0	-	0	-
55	0	1	1	100	1	1	2	50	1	1	2	50
56	0	0	0	-	0	2	2	100	1	0	1	0
57	1	1	2	50	3	1	4	25	2	0	2	0
58	1	1	2	50	1	2	3	67	2	0	2	0
59	1	1	2	50	0	5	5	100	1	1	2	50
60	-	3	3	100	1	1	2	50	0	1	1	100
61	-	4	4	100	-	3	3	100	1	2	3	67
62	-	3	3	100	-	5	5	100	1	2	3	67
63	-	2	2	100	-	0	0	-	-	2	2	100
64	-	0	0	-	-	1	1	100	-	2	2	100
65	-	3	3	100	-	2	2	100	-	3	3	100
66	-	1	1	100	-	0	0	-	-	1	1	100
67	-	3	3	100	-	1	1	100	-	1	1	100
68	-	0	0	-	-	5	5	100	-	0	0	-
69	-	2	2	100	-	0	0	-	-	0	0	-
70	-	2	2	100	-	0	0	-	-	0	0	-
71	-	1	1	100	-	0	0	-	-	2	2	100
72	-	1	1	100	-	1	1	100	-	1	1	100
73	-	1	1	100	-	0	0	-	-	2	2	100
74	-	1	1	100	-	2	2	100	-	4	4	100
75	-	1	1	100	-	1	1	100	-	2	2	100
76	-	2	2	100	-	1	1	100	-	3	3	100
77	-	2	2	100	-	0	0	-	-	0	0	-
78	-	0	0	-	-	0	0	-	-	0	0	-
79	-	0	0	-	-	0	0	-	-	0	0	-
80	-	0	0	-	-	1	1	100	-	1	1	100
81	-	1	1	100	-	0	0	-	-	0	0	-
82	-	1	1	100	-	0	0	-	-	2	2	100
83	-	0	0	-	-	0	0	-	-	0	0	-
84	-	0	0	-	-	1	1	100	-	0	0	-
85	-	0	0	-	-	-	-	-	-	1	1	100
86	-	0	0	-	-	-	-	-	-	0	0	-
87	-	0	0	-	-	-	-	-	-	1	1	100
88	-	0	0	-	-	-	-	-	-	-	-	-
89	-	1	1	100	-	-	-	-	-	-	-	-
Total	8	42	50		25	36	61		16	35	51	

Table 2. (cont'd)

Length	Two Peaks C 3/31, 1980				White Rocks C 1/13-2/9, 1982				White Rocks C 2/8-3/22, 1983			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
27	1	-	1	0	-	-	-	-	-	-	-	-
28	0	-	0	-	-	-	-	-	-	-	-	-
29	0	-	0	-	-	-	-	-	-	-	-	-
30	0	-	0	-	-	-	-	-	-	-	-	-
31	0	-	0	-	-	-	-	-	-	-	-	-
32	0	-	0	-	-	-	-	-	-	-	-	-
33	0	-	0	-	-	-	-	-	-	-	-	-
34	0	-	0	-	-	-	-	-	-	-	-	-
35	0	-	0	-	-	-	-	-	-	-	-	-
36	0	-	0	-	-	1	1	100	-	-	-	-
37	0	-	0	-	-	0	0	-	-	-	-	-
38	0	-	0	-	-	0	0	-	-	-	-	-
39	2	-	2	0	-	0	0	-	-	-	-	-
40	0	-	0	-	1	0	1	0	-	-	-	-
41	0	-	0	-	1	0	1	0	1	-	1	0
42	7	-	7	0	1	1	2	50	0	-	0	-
43	12	-	12	0	2	2	4	50	2	-	2	0
44	12	-	12	0	3	1	4	25	3	-	3	0
45	9	-	9	0	2	2	4	50	2	-	2	0
46	9	-	9	0	4	1	5	20	2	3	5	60
47	4	1	5	20	4	2	6	33	1	4	5	80
48	4	0	4	0	6	1	7	14	8	3	11	27
49	3	0	3	0	6	4	10	40	4	1	5	20
50	3	0	3	0	3	8	11	73	4	12	16	75
51	4	1	5	20	5	7	12	58	4	3	7	43
52	4	1	5	20	4	7	11	64	4	4	8	50
53	1	0	1	0	5	9	14	64	4	3	7	43
54	0	2	2	100	3	8	11	73	1	10	11	91
55	1	1	2	50	7	5	12	42	3	17	20	85
56	4	0	4	0	2	4	6	67	2	28	30	93
57	0	0	0	-	5	4	9	44	1	26	27	96
58	1	6	7	86	1	15	16	94	3	28	31	90
59	-	0	0	-	2	2	4	50	2	48	50	96
60	-	0	0	-	0	7	7	100	1	58	59	98
61	-	1	1	100	0	5	5	100	0	31	31	100
62	-	1	1	100	2	5	7	71	2	42	44	95
63	-	0	0	-	1	4	5	80	-	36	36	100
64	-	1	1	100	-	4	4	100	-	66	66	100
65	-	1	1	100	-	6	6	100	-	39	39	100
66	-	0	0	-	-	2	2	100	-	45	45	100
67	-	1	1	100	-	4	4	100	-	55	55	100
68	-	2	2	100	-	5	5	100	-	38	38	100
69	-	0	0	-	-	5	5	100	-	30	30	100
70	-	0	0	-	-	0	0	-	-	40	40	100
71	-	1	1	100	-	5	5	100	-	16	16	100
72	-	0	0	-	-	5	5	100	-	34	34	100
73	-	1	1	100	-	2	2	100	-	20	20	100
74	-	3	3	100	-	2	2	100	-	10	10	100
75	-	0	0	-	-	2	2	100	-	13	13	100
76	-	1	1	100	-	1	1	100	-	12	12	100
77	-	0	0	-	-	2	2	100	-	6	6	100
78	-	1	1	100	-	0	0	-	-	10	10	100
79	-	-	-	-	-	0	0	-	-	2	2	100
80	-	-	-	-	-	0	0	-	-	7	7	100
81	-	-	-	-	-	0	0	-	-	1	1	100
82	-	-	-	-	-	0	0	-	-	2	2	100
83	-	-	-	-	-	0	0	-	-	1	1	100
84	-	-	-	-	-	2	2	100	-	-	-	-
Total	81	26	107		70	152	222		54	804	858	

Table 2. (cont'd)

Length	White Rocks C 2/7-3/20, 1985				White Rocks C 1/21-3/10, 1986				White Rocks R 1/7-11, 1987			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
33	-	-	-	-	-	-	-	-	1	-	1	0
34	-	-	-	-	-	-	-	-	1	-	1	0
35	-	-	-	-	-	-	-	-	3	-	3	0
36	-	-	-	-	-	-	-	-	6	-	6	0
37	-	-	-	-	-	-	-	-	6	-	6	0
38	-	-	-	-	-	-	-	-	3	-	3	0
39	-	-	-	-	-	-	-	-	13	-	13	0
40	-	-	-	-	-	-	-	-	17	-	17	0
41	-	-	-	-	-	-	-	-	14	-	14	0
42	-	-	-	-	-	-	-	-	13	-	13	0
43	1	2	3	67	-	-	-	-	20	-	20	0
44	2	0	2	0	-	-	-	-	22	4	26	15
45	0	1	1	100	7	-	7	0	19	2	21	10
46	0	4	4	100	6	-	6	0	20	2	22	9
47	0	1	1	100	6	-	6	0	25	2	27	7
48	2	2	4	50	2	-	2	0	23	0	23	0
49	0	5	5	100	3	-	3	0	10	1	11	9
50	0	8	8	100	3	4	7	57	13	1	14	7
51	2	5	7	71	0	0	0	-	14	4	18	22
52	0	4	4	100	1	0	1	0	7	1	8	13
53	0	9	9	100	2	0	2	0	5	1	6	17
54	0	6	6	100	0	0	0	-	5	4	9	44
55	1	12	13	92	0	0	0	-	2	6	8	75
56	1	19	20	95	1	6	7	86	4	11	15	73
57	-	10	10	100	-	3	3	100	5	12	17	71
58	-	12	12	100	-	7	7	100	3	6	9	67
59	-	18	18	100	-	7	7	100	2	16	18	89
60	-	19	19	100	-	6	6	100	2	19	21	90
61	-	8	8	100	-	19	19	100	1	27	28	96
62	-	16	16	100	-	23	23	100	-	21	21	100
63	-	10	10	100	-	10	10	100	-	26	26	100
64	-	14	14	100	-	17	17	100	-	17	17	100
65	-	11	11	100	-	18	18	100	-	16	16	100
66	-	10	10	100	-	36	36	100	-	25	25	100
67	-	12	12	100	-	36	36	100	-	17	17	100
68	-	6	6	100	-	44	44	100	-	16	16	100
69	-	7	7	100	-	36	36	100	-	8	8	100
70	-	6	6	100	-	21	21	100	-	9	9	100
71	-	8	8	100	-	4	4	100	-	15	15	100
72	-	8	8	100	-	9	9	100	-	6	6	100
73	-	5	5	100	-	2	2	100	-	14	14	100
74	-	5	5	100	-	3	3	100	-	12	12	100
75	-	12	12	100	-	3	3	100	-	13	13	100
76	-	2	2	100	-	2	2	100	-	7	7	100
77	-	0	0	-	-	0	0	-	-	11	11	100
78	-	4	4	100	-	1	1	100	-	5	5	100
79	-	0	0	-	-	-	-	-	-	5	5	100
80	-	4	4	100	-	-	-	-	-	4	4	100
81	-	0	0	-	-	-	-	-	-	5	5	100
82	-	0	0	-	-	-	-	-	-	6	6	100
83	-	0	0	-	-	-	-	-	-	1	1	100
84	-	2	2	100	-	-	-	-	-	5	5	100
85	-	1	1	100	-	-	-	-	-	2	2	100
86	-	-	-	-	-	-	-	-	-	1	1	100
87	-	-	-	-	-	-	-	-	-	0	0	-
88	-	-	-	-	-	-	-	-	-	0	0	-
89	-	-	-	-	-	-	-	-	-	0	0	-
90	-	-	-	-	-	-	-	-	-	1	1	100
Total	9	288	297		31	317	348		279	387	666	

Table 2. (cont'd)

Length	White Rocks C 1/14, 1987				White Rocks C 1/15, 1987				White Rocks C 1/19, 1987			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
38	-	-	-	-	1	-	1	0	-	-	-	-
39	-	-	-	-	1	-	1	0	-	-	-	-
40	1	-	1	0	3	-	3	0	-	-	-	-
41	0	-	0	-	9	-	9	0	-	-	-	-
42	0	-	0	-	10	-	10	0	-	-	-	-
43	1	-	1	0	13	-	13	0	-	-	-	-
44	2	-	2	0	18	2	20	10	-	-	-	-
45	6	-	6	0	18	0	18	0	-	-	-	-
46	3	-	3	0	20	1	21	5	1	-	1	0
47	4	-	4	0	15	0	15	0	0	-	0	-
48	5	-	5	0	13	0	13	0	0	-	0	-
49	8	2	10	20	9	0	9	0	3	1	4	25
50	7	0	7	0	10	0	10	0	2	0	2	0
51	0	1	1	100	1	0	1	0	2	0	2	0
52	4	1	5	20	3	0	3	0	2	2	4	50
53	0	1	1	100	2	0	2	0	1	1	2	50
54	1	0	1	0	3	0	3	0	0	1	1	100
55	3	1	4	25	2	1	3	33	0	1	1	100
56	0	3	3	100	1	4	5	80	0	2	2	100
57	3	5	8	63	1	3	4	75	0	2	2	100
58	3	2	5	40	1	2	3	67	0	2	2	100
59	1	5	6	83	0	5	5	100	1	1	2	50
60	1	9	10	90	1	3	4	75	-	4	4	100
61	0	2	2	100	0	1	1	100	-	2	2	100
62	0	2	2	100	0	3	3	100	-	6	6	100
63	0	5	5	100	0	4	4	100	-	4	4	100
64	1	10	11	91	0	3	3	100	-	2	2	100
65	1	4	5	80	0	2	2	100	-	7	7	100
66	-	5	5	100	0	3	3	100	-	4	4	100
67	-	4	4	100	0	2	2	100	-	3	3	100
68	-	5	5	100	0	3	3	100	-	3	3	100
69	-	8	8	100	1	2	3	67	-	6	6	100
70	-	6	6	100	-	3	3	100	-	3	3	100
71	-	5	5	100	-	5	5	100	-	5	5	100
72	-	2	2	100	-	0	0	-	-	3	3	100
73	-	8	8	100	-	2	2	100	-	4	4	100
74	-	13	13	100	-	3	3	100	-	4	4	100
75	-	4	4	100	-	1	1	100	-	8	8	100
76	-	3	3	100	-	1	1	100	-	4	4	100
77	-	2	2	100	-	5	5	100	-	1	1	100
78	-	12	12	100	-	1	1	100	-	2	2	100
79	-	1	1	100	-	1	1	100	-	2	2	100
80	-	2	2	100	-	0	0	-	-	2	2	100
81	-	3	3	100	-	0	0	-	-	1	1	100
82	-	0	0	-	-	1	1	100	-	2	2	100
83	-	2	2	100	-	-	-	-	-	-	-	-
84	-	0	0	-	-	-	-	-	-	-	-	-
85	-	0	0	-	-	-	-	-	-	-	-	-
86	-	0	0	-	-	-	-	-	-	-	-	-
87	-	0	0	-	-	-	-	-	-	-	-	-
88	-	0	0	-	-	-	-	-	-	-	-	-
89	-	0	0	-	-	-	-	-	-	-	-	-
90	-	0	0	-	-	-	-	-	-	-	-	-
91	-	0	0	-	-	-	-	-	-	-	-	-
92	-	0	0	-	-	-	-	-	-	-	-	-
93	-	0	0	-	-	-	-	-	-	-	-	-
94	-	1	1	100	-	-	-	-	-	-	-	-
Total	55	139	194		156	67	223		12	95	107	

Table 2. (cont'd)

Length	White Rocks C 1/22, 1987				White Rocks C 1/28, 1987				White Rocks C 2/5, 1987			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
33	1	-	1	0	-	-	-	-	-	-	-	-
34	0	-	0	-	-	-	-	-	-	-	-	-
35	0	-	0	-	-	-	-	-	-	-	-	-
36	0	-	0	-	-	-	-	-	-	-	-	-
37	1	-	1	0	-	-	-	-	-	-	-	-
38	0	-	0	-	-	-	-	-	1	-	1	0
39	0	-	0	-	-	-	-	-	0	-	0	-
40	0	-	0	-	1	-	1	0	3	-	3	0
41	2	-	2	0	2	-	2	0	4	-	4	0
42	0	-	0	-	1	-	1	0	14	-	14	0
43	3	1	4	25	3	-	3	0	19	1	20	5
44	7	0	7	0	5	-	5	0	12	0	12	0
45	6	0	6	0	5	1	6	17	14	0	14	0
46	12	0	12	0	10	0	10	0	17	0	17	0
47	17	2	19	11	2	2	4	50	12	0	12	0
48	12	0	12	0	6	0	6	0	19	2	21	10
49	7	0	7	0	5	0	5	0	11	1	12	8
50	9	1	10	10	6	0	6	0	17	0	17	0
51	8	0	8	0	4	0	4	0	12	0	12	0
52	3	0	3	0	0	0	0	-	9	1	10	10
53	1	2	3	67	0	0	0	-	3	1	4	25
54	3	0	3	0	0	2	2	100	2	2	4	50
55	2	0	2	0	0	0	0	-	2	1	3	33
56	0	1	1	100	0	2	2	100	0	1	1	100
57	0	2	2	100	0	1	1	100	0	0	0	-
58	0	1	1	100	0	0	0	-	0	1	1	100
59	0	2	2	100	1	1	2	50	2	1	3	33
60	0	4	4	100	0	5	5	100	0	2	2	100
61	0	4	4	100	0	1	1	100	0	2	2	100
62	0	7	7	100	0	5	5	100	1	2	3	67
63	0	4	4	100	0	4	4	100	-	1	1	100
64	0	7	7	100	0	6	6	100	-	2	2	100
65	1	9	10	90	0	8	8	100	-	0	0	-
66	0	7	7	100	0	5	5	100	-	3	3	100
67	0	8	8	100	0	2	2	100	-	0	0	-
68	0	4	4	100	0	5	5	100	-	4	4	100
69	0	2	2	100	0	2	2	100	-	1	1	100
70	0	6	6	100	0	3	3	100	-	1	1	100
71	1	5	6	83	1	4	5	80	-	1	1	100
72	0	8	8	100	1	3	4	75	-	1	1	100
73	2	4	6	67	-	1	1	100	-	2	2	100
74	-	7	7	100	-	7	7	100	-	0	0	-
75	-	6	6	100	-	2	2	100	-	0	0	-
76	-	2	2	100	-	2	2	100	-	1	1	100
77	-	3	3	100	-	2	2	100	-	1	1	100
78	-	2	2	100	-	2	2	100	-	-	-	-
79	-	1	1	100	-	2	2	100	-	-	-	-
80	-	-	-	-	-	2	2	100	-	-	-	-
81	-	-	-	-	-	1	1	100	-	-	-	-
82	-	-	-	-	-	2	2	100	-	-	-	-
83	-	-	-	-	-	1	1	100	-	-	-	-
84	-	-	-	-	-	0	0	-	-	-	-	-
85	-	-	-	-	-	1	1	100	-	-	-	-
Total	98	112	210		53	87	140		174	36	210	

Table 2. (cont'd)

Length	White Rocks C 2/19, 1987				White Rocks C 2/20, 1987				White Rocks C 2/26, 1987			
(cm)	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat	Imm	Mat	Tot	%mat
42	1	-	1	0	-	1	1	100	1	-	1	0
43	0	-	0	-	-	0	0	-	1	-	1	0
44	0	-	0	-	0	0	0	-	0	-	0	-
45	4	-	4	0	0	0	0	-	2	1	3	33
46	3	-	3	0	1	0	1	0	3	0	3	0
47	2	1	3	33	3	0	3	0	3	0	3	0
48	6	0	6	0	1	0	1	0	7	2	9	22
49	4	0	4	0	3	0	3	0	8	0	8	0
50	3	0	3	0	6	1	7	14	8	1	9	11
51	3	0	3	0	3	0	3	0	9	1	10	10
52	2	0	2	0	0	1	1	100	12	2	14	14
53	1	1	2	50	3	0	3	0	1	2	3	67
54	2	0	2	0	3	1	4	25	2	1	3	33
55	3	3	6	50	2	0	2	0	1	1	2	50
56	0	3	3	100	2	1	3	33	0	3	3	100
57	1	1	2	50	2	0	2	0	0	1	1	100
58	0	3	3	100	0	5	5	100	0	2	2	100
59	1	4	5	80	0	3	3	100	0	3	3	100
60	0	6	6	100	4	3	7	43	0	6	6	100
61	1	8	9	89	0	2	2	100	0	3	3	100
62	0	13	13	100	-	3	3	100	0	9	9	100
63	2	9	11	82	-	10	10	100	0	2	2	100
64	-	10	10	100	-	7	7	100	2	9	11	82
65	-	13	13	100	-	9	9	100	-	10	10	100
66	-	13	13	100	-	7	7	100	-	10	10	100
67	-	11	11	100	-	7	7	100	-	7	7	100
68	-	15	15	100	-	5	5	100	-	11	11	100
69	-	10	10	100	-	6	6	100	-	9	9	100
70	-	9	9	100	-	6	6	100	-	15	15	100
71	-	18	18	100	-	4	4	100	-	8	8	100
72	-	9	9	100	-	4	4	100	-	11	11	100
73	-	8	8	100	-	2	2	100	-	7	7	100
74	-	10	10	100	-	1	1	100	-	5	5	100
75	-	11	11	100	-	3	3	100	-	2	2	100
76	-	5	5	100	-	4	4	100	-	9	9	100
77	-	10	10	100	-	1	1	100	-	7	7	100
78	-	3	3	100	-	2	2	100	-	6	6	100
79	-	3	3	100	-	1	1	100	-	1	1	100
80	-	2	2	100	-	3	3	100	-	1	1	100
81	-	3	3	100	-	2	2	100	-	1	1	100
82	-	3	3	100	-	2	2	100	-	2	2	100
83	-	3	3	100	-	-	-	-	-	4	4	100
84	-	1	1	100	-	-	-	-	-	2	2	100
85	-	0	0	-	-	-	-	-	-	0	0	-
86	-	0	0	-	-	-	-	-	-	1	1	100
87	-	0	0	-	-	-	-	-	-	-	-	-
88	-	1	1	100	-	-	-	-	-	-	-	-
Total	39	223	262		33	107	140		60	178	238	

Table 2. (cont'd)

Length	White Rocks C 3/19, 1987			
(cm)	Imm	Mat	Tot	%mat
45	-	1	1	100
46	8	0	8	0
47	9	0	9	0
48	14	0	14	0
49	9	0	9	0
50	21	2	23	9
51	17	1	18	6
52	19	2	21	10
53	12	2	14	14
54	7	1	8	13
55	8	1	9	11
56	2	0	2	0
57	4	2	6	33
58	1	5	6	83
59	1	4	5	80
60	0	5	5	100
61	0	1	1	100
62	0	6	6	100
63	1	4	5	80
64	0	6	6	100
65	0	4	4	100
66	1	8	9	89
67	0	3	3	100
68	0	5	5	100
69	0	2	2	100
70	0	6	6	100
71	0	3	3	100
72	0	3	3	100
73	0	4	4	100
74	1	2	3	67
75	-	0	0	-
76	-	2	2	100
77	-	4	4	100
78	-	3	3	100
79	-	1	1	100
80	-	0	0	-
81	-	1	1	100
82	-	0	0	-
83	-	2	2	100
84	-	1	1	100
Total	135	97	232	